

## **THE CLAIMS**

What is claimed is:

1. A golf ball comprising a core and a cover, wherein at least one of the core and the  
5 cover is cast from a castable reactive acrylate functional composition comprising:  
at least one acrylate functional component; and  
at least one free radical initiator.
2. The golf ball of claim 1, wherein the at least one acrylate functional component is  
10 selected from the group consisting of monofunctional, difunctional, trifunctional,  
tetrafunctional, and pentafunctional monomers and oligomers, and combinations thereof.
3. The golf ball of claim 1, wherein the at least one acrylate functional component  
15 comprises about 1 percent to about 100 percent urethane acrylate, urea acrylate, or a  
combination thereof.
4. The golf ball of claim 1, wherein the at least one acrylate functional component is  
selected from the group consisting of water dispersible monomers, adhesion promoting  
monomers, pigment dispersing monomers, fire retarding monomers, metallic diacrylate,  
20 metallic dimethacrylate, epoxy acrylates, epoxy methacrylates, acrylate half esters,  
methacrylate half esters, polybutadiene acrylates, and combinations thereof.
5. The golf ball of claim 1, wherein the at least one acrylate functional component has a  
viscosity of about 100 cP or greater.  
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6. The golf ball of claim 1, wherein the at least one free radical initiator comprises at  
least one peroxide.
7. The golf ball of claim 1, wherein the at least one free radical initiator comprises at  
30 least one azo compound.
8. The golf ball of claim 6, wherein the at least one free radical initiator is selected from  
the group consisting of di-t-amyl peroxide, tert-amyl peroxy-2-ethylhexyl carbonate, t-amyl  
peroxyacetate, ethyl 3,3-D (t-amylperoxy) butyrate, 2,2-di-(t-amylperoxy) propane, t-amyl

perbenzoate, di(2-t-butyl-peroxyisopropyl)benzene peroxide, 1,1-bis(t-butylperoxy)-3,3,5-trimethylcyclohexane, dicumyl peroxide, di-t-butyl peroxide, 2,5-di-(t-butylperoxy)-2,5-dimethyl hexane, n-butyl-4,4-bis(t-butylperoxy)valerate, lauryl peroxide, benzoyl peroxide, t-butyl hydroperoxide, and mixtures thereof.

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9. The golf ball of claim 1, further comprising an intermediate layer.

10. The golf ball of claim 9, wherein the intermediate layer comprises an ionomeric material.

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11. The golf ball of claim 1, wherein the golf ball further comprises at least one top coat disposed about the cover.

12. The golf ball of claim 11, wherein the cover has a thickness of about 50  $\mu\text{m}$  or greater.

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13. The golf ball of claim 12, wherein the cover has a thickness of about 0.2 inches to about 0.035 inches.

20 14. An acrylate functional composition for a structural layer of a golf ball comprising:  
a polyurethane backbone formed from the reaction of at least one isocyanate and  
at least one polyol;  
at least one unsaturated acrylate functional segment reacted with the polyurethane  
backbone; and  
25 at least one free radical initiator.

15. The composition of claim 14, wherein the at least one unsaturated acrylate functional segment comprises hydroxy-terminated acrylates, amine-terminated acrylates, or mixtures thereof.

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16. The composition of claim 15, wherein the at least one acrylate functional segment comprises hydroxy-terminated acrylate, methacrylate, methyl methacrylate, ethyl acrylate, ethyl methacrylate, butyl acrylate, butyl methacrylate, glycidyl acrylate, glycidal methacrylate, or mixtures thereof.

17. The composition of claim 14, wherein the at least one free radical initiator comprises at least one peroxide.

18. The composition of claim 17, wherein the at least one free radical initiator comprises di-t-amyl peroxide, di(2-t-butyl-peroxyisopropyl)benzene peroxide, 1,1-bis(t-butylperoxy)-3,3,5-trimethylcyclohexane, dicumyl peroxide, di-t-butyl peroxide, 2,5-di-(t-butylperoxy)-2,5-dimethyl hexane, n-butyl-4,4-bis(t-butylperoxy)valerate, lauryl peroxide, benzoyl peroxide, t-butyl hydroperoxide, or mixtures thereof.

19. The composition of claim 17, wherein the at least one free radical initiator is selected from the group consisting of di-t-amyl peroxide, tert-amyl peroxy-2-ethylhexyl carbonate, t-amyl peroxyacetate, ethyl 3,3-D (t-amylperoxy) butyrate, 2,2-di-(t-amylperoxy) propane, t-amyl perbenzoate, and mixtures thereof.

20. The composition of claim 14, wherein the composition forms a cover layer of the golf ball.

21. The composition of claim 14, wherein the composition comprises about 1 to about 100 percent of urethane acrylate and about 99 percent to 0 percent of at least one unsaturated acrylate resin.

22. The composition of claim 21, wherein the at least one unsaturated acrylate resin comprises epoxy acrylates, epoxy methacrylates, acrylate half esters, methacrylate half esters, polybutadiene acrylates, urea acrylates, and combinations thereof.

23. An acrylate functional composition for a structural layer of a golf ball comprising:  
a polyurea backbone formed from the reaction of at least one isocyanate, at least one amine-terminated compound;  
at least one unsaturated acrylate functional segment reacted with the polyurea backbone; and  
at least one free radical initiator.

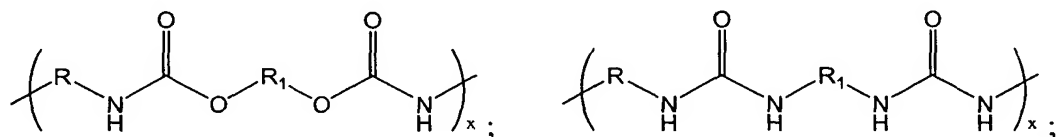
24. The composition of claim 23, wherein the at least one unsaturated acrylate functional

segment comprises acrylate, methacrylate, methyl methacrylate, ethyl acrylate, ethyl methacrylate, butyl acrylate, butyl methacrylate, glycidyl acrylate, glycidal methacrylate, or mixtures thereof.

5 25. The composition of claim 23, wherein the amine-terminated compound is selected from the group consisting of amine-terminated hydrocarbons, amine-terminated polyethers, amine-terminated polyesters, amine-terminated polycaprolactones, amine-terminated polycarbonates, amine-terminated polyamides, and mixtures thereof.

10 26. The composition of claim 25, wherein the amine-terminated compound comprises primary amines, secondary amines, triamines, or combinations thereof.

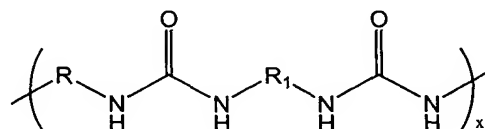
27. The composition of claim 23, wherein the polyurea backbone comprises linkages having the general formulae:



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or a mixture thereof, wherein x is the chain length, *i.e.*, about 1 or greater, and wherein R and R<sub>1</sub> are straight chain or branched hydrocarbon chains having about 1 to about 20 carbons, and wherein the linkages form greater than about 10 percent of the polyurea backbone.

20 28. The composition of claim 23, wherein the polyurea backbone consists essentially of linkages having the general formula:



25 wherein x is the chain length, *i.e.*, about 1 or greater, and wherein R and R<sub>1</sub> comprise straight chain or branched hydrocarbon chains having about 1 to about 20 carbons, and wherein the linkages form greater than about 10 percent of the polyurea backbone.

29. The composition of claim 23, wherein the at least one free radical initiator comprises

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at least one peroxide.

30. The composition of claim 23, wherein the at least one free radical initiator is selected from the group consisting of di-t-amyl peroxide, tert-amyl peroxy-2-ethylhexyl carbonate, t-  
5 amyl peroxyacetate, ethyl 3,3-D (t-amylperoxy) butyrate, 2,2-di-(t-amylperoxy) propane, t-amyl perbenzoate, and mixtures thereof.

31. The composition of claim 23, wherein the composition comprises about 1 to about  
100 percent of urea acrylate and about 99 percent to 0 percent of at least one unsaturated  
10 acrylate resin.